MISSOURI DEPARTMENT OF TRANSPORTATION
MATERIALS ENGINEERING
Jefferson City, Missouri

Test Method
MoDOT T61
ASPHALT DRAINDOWN TEST PROCEDURE FOR STONE MASTIC ASPHALT MIXTURES

1.0 SCOPE

1.1 This test method covers the determination of the amount of draindown in an uncompacted Stone Mastic Asphalt (SMA) mixture sample when the sample is held at elevated temperatures comparable to those encountered during the production, storage, transport, and placement of the mixture. (Note 1).

Note 1: This test procedure is an adaptation of the NCAT Asphalt Draindown Test Procedure.

1.2 For the purpose of this test method, draindown is considered to be that portion of the asphalt cement which separates itself from the sample as a whole and is deposited outside the wire basket during the test.

2.0 APPARATUS.

2.1 Oven, capable of maintaining the temperature in a range of 120 - 175 C . The oven should maintain the set temperature to within ± 2 C.

2.2 Paper plates of appropriate size and of appropriate durability to withstand the oven temperature.

2.3 Standard cylindrical shaped basket 165 mm tall and 108 mm in diameter, with the basket bottom located 25 mm above the bottom of the outside wall. The entire basket shall be constructed using standard 6.3 mm sieve cloth as specified in AASHTO M 92.

2.4 Spatulas, trowels, mixer, and bowls as needed.

2.5 Balance accurate to 0.1 gram.

3.0 PROCEDURE.

3.1 Sample Preparation.

3.1.1 Laboratory Prepared Samples.

3.1.1.1 For each mixture tested, the draindown characteristics should be determined at the anticipated plant production temperature. Two samples should be tested.

3.1.1.2 Dry the aggregate to a constant mass and sieve it into appropriate size fractions as indicated in AASHTO T 245, Section 3.2.

3.1.1.3 Determine the anticipated plant production temperature or select a mixing temperature in accordance with AASHTO T 245, Section 3.3.1. The asphalt cement supplier's recommendations should be sought when using modified asphalt cement.

3.1.1.4 Measure out into separate pans for each test sample the amount of each size fraction required to produce completed SMA mixture samples having a mass of 1200 grams. The aggregate fractions shall be combined such that the resulting aggregate blend has the same gradations as the job mix formula. Place the aggregate samples in an oven and heat to a temperature not to exceed the mixing temperature established in 3.1.1.3 by more than approximately 28 C.

3.1.1.5 Heat the asphalt cement to the temperature established in 3.1.1.3.

3.1.1.6 Place the heated aggregate in the mixing bowl. Add any stabilizer (Note 2) as directed by the supplier and thoroughly mix the dry components. Form a crater in the aggregate blend and add the required amount of asphalt. The amount of asphalt shall be such that the final sample has the same asphalt content as the job-mix-formula. At this point, the temperature of the aggregate and asphalt cement shall be within the limits of the mixing temperature established in 3.1.1.3. Using a spatula (if mixing by hand) or a mixer, mix the aggregate (and stabilizer) and asphalt cement quickly, until the aggregate is thoroughly coated.

Note 2 - Some types of stabilizers such as fibers or some polymers must be added directly to the aggregate prior to mixing with the asphalt cement. Other types must be added directly to the asphalt cement prior to blending with the aggregate.

3.1.2 Plant Produced Sample.

3.1.2.1 For plant produced samples, duplicate samples should be tested at the plant production temperature.

3.1.2.2 Samples may be obtained during plant production by sampling the mixture at the trucks prior to the mixture leaving the plant. Samples obtained during actual production should be reduced to the proper test sample size by the quartering method.

4.0 TESTING.

4.1 Transfer the laboratory produced or plant produced uncompacted SMA mixture sample to the tared wire basket. Place the entire sample in the wire basket. Do not

consolidate or otherwise disturb the sample after transfer to the basket. Determine the mass of the sample to the nearest 0.1 gram.

4.2 Determine and record the mass of a paper plate to the nearest 0.1 gram. Place the basket on the paper plate and place the assembly into the oven at the temperature as determined in 3.1.1.3 for 60 ± 1 minutes.

4.3 After the sample has been in the oven for 60 minutes, remove the basket and paper plate. Determine and record the mass of the paper plate to the nearest 0.1 gram.

4.4 Any noticeable aggregate particles that are deposited outside the basket should be added back into the mixture and not counted as draindown. Alternatively, the test should be rerun.

5.0 CALCULATIONS.

5.1 Calculate the percent of mixture which drained by subtracting the initial paper plate mass from the final paper plate mass and divide this by the initial total sample mass. Multiply the result by 100 to obtain a percentage.

6.0 REPORT.

6.1 Report the average percent drainage at the test temperature for the two samples.